

EXHIBIT #4



The Ultimate Computer Reference

*The Comprehensive Standard for Business,
School, Library, and Home*



Microsoft Press[®] **Computer Dictionary** Third Edition

- **Over 7,600 terms and definitions**
- **345 illustrations and diagrams**
- **Extensive Internet and Web coverage**
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Microsoft Press

Microsoft Press
**Computer
Dictionary**

Third Edition

Microsoft Press

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Introduction

The *Microsoft Press Computer Dictionary, Third Edition* is designed to be a comprehensive and authoritative source of definitions for computer-related terms and abbreviations. The dictionary includes terms drawn from a wide variety of topics:

Applications

- Databases
- Desktop Publishing
- Multimedia
- Spreadsheets
- Word Processing

Communication and Networks

- E-mail
- Intranet

Data and Data Storage

Games

Graphics

Hardware

- Architecture
- Chips, Cards, and Boards
- Computers
- Disks, Drives, and Other Media
- Peripherals
- Processors

History

Information Processing

- General Computing
- Input/Output
- Memory and Memory Management

Internet

- Protocols
- Security
- Tools (user and developer)
- World Wide Web

Organizations

Software Engineering

- Concepts
- Programming Languages
- Tools and Techniques

Standards

Systems and Environments

- Operating Systems



Introduction

Although this book covers nearly every aspect of computing, it does not include entries on most companies or on most makes and models of computers, nor does it contain entries on most application software products. The few exceptions to this rule of thumb are key companies and products that have a historical or universal importance within the computing industry.

This dictionary emphasizes terminology that the average computer user will encounter in documentation, online help, computer manuals, marketing and sales materials, the popular media, and the computer trade press. Because most computer users operate personal computers and desktop systems at home, work, or both, the majority of the entries in this dictionary cover the terminology used in describing and working with these systems. However, some specialized or highly technical language is included that pertains to areas of industry, academia, software and hardware development, and research. These terms have been included because they have a bearing on more common computer terminology or because they are of historical significance.

Changes in the Third Edition

The third edition of the *Microsoft Press Computer Dictionary* has been revised and updated to reflect the many advances in the computer field and to include several areas that have come into prominence in the public eye, such as the Internet. Over 2,500 new entries have been added, covering the Internet, the World Wide Web, network computing, hardware and software advances, virtual reality, multimedia, and work-group computing.

Existing entries from the second edition of the *Microsoft Press Computer Dictionary* have been updated to include changes in the field.

All entries have been styled in a more traditional dictionary format than in previous editions. Pronunciations and parts of speech are given for all terms. Entries that have more than one sense, or definition, are broken into numbered lists.

Order of Presentation

Entries are alphabetized by letter. Spaces are ignored, as are characters such as hyphens and slashes; for example, *Baudot code* falls between *baud* and *baud rate*, and *machine-independent* falls between *machine identification* and *machine instruction*. Numbers and symbols are located at the beginning of the book and are listed in ascending ASCII order. If an entry begins with a letter or letters but contains a number, it is listed alphabetically, according to the initial letter(s), and then according to ASCII order. Thus, *V20* precedes *V.2x*, and both precede *VAB*.

Entries

Entries are of two types: main entries, which contain full definitions, and synonymous cross-references, which contain *See* references to the appropriate main entries. Synonymous cross-references are generally secondary or less common ways of referring to a main entry. The definition at the main entry can be substituted as a definition for the synonymous cross-reference.

Format

Information in each main entry is presented in a consistent format: entry name in boldface, spelling variants (if any), pronunciation, part of speech, definition, illustration or table references (if any), acronym (if any), alternative names (if any), and cross-references (if any).

Main Entries

Entries that are acronyms or abbreviations for one or more words or concatenations of two or more words have those words spelled out at the beginning of the definition. The letters in these words or phrases that make up the acronym, abbreviation, or concatenation are in boldface.

When a main entry is spelled exactly the same as another main entry, the two entries are differentiated by the use of a superscript numeral after each

term. These entries are called homographs, and they are generally different parts of speech. For example,

e-mail¹ (noun)

e-mail² (verb)

Spelling Variants

When a main entry has one or more variations in the way it is spelled, each spelling variant follows the main entry, after the word *or*.

Pronunciations

Pronunciation keys appear after all defined terms in the dictionary. Within the pronunciation keys, individual words are separated by word spaces, and syllables within each word are separated by stress marks or hyphens.

Variant Pronunciations

The *Microsoft Press Computer Dictionary, Third Edition* uses a generalized system for representing pronunciations, particularly for the vowels. There are many subtle variations, well known to phonologists in particular, in the ways Americans in different parts of the United States pronounce many vowels. However, most can recognize words that are pronounced slightly differently by others and should be able to interpret the broad category represented for each of the vowel sounds in this dictionary and apply it in their own regional variation or dialect. This dictionary represents only standard American pronunciations, but there are cases in which sufficient divergence in pronunciation exists, even within the United States, so some variant pronunciations have been included.

Variants are separated by commas, and the most common pronunciation may appear first. However, because there are many cases where two pronunciations are (at least roughly) equally widely used, the order in which they appear should not be interpreted to mean that the first one given is more “correct” or common than the other(s). Variants are shown on a word-by-word basis; for a multiword entry, pronunciation keys are given only for the word or words that have variant pronunciations.

For words that are spelled with the letters *wh*, the pronunciation is listed with two variants: one with a simple *w* (w) and one with the *hw* sound (hw).

Words that are spelled with either *au* or *aw* include a variant pronunciation with the letter *o* with a circumflex accent (ô), which represents the vowel sound some Americans (those who make a significant distinction between this sound and a “regular” short *o*) pronounce when they say the word *dawn*. In some parts of the country, this vowel sound is also used in words with other spellings, such as *coffee* or *talk*, but this seems to be a distinctly dialectical variation rather than a standard one. It is therefore very difficult for any individual to predict how any other might pronounce these particular words, so variants have not been included for them.

Stress

The syllable or syllables pronounced with the heaviest, or primary, stress in a term are followed by acute accents (´); those with lighter, or secondary, stress are followed by grave accents (`). For example, in the word *computer*, the second syllable is spoken more forcefully, or with more stress, than the first and third syllables and therefore is followed in the pronunciation key by an acute accent (kəm-pyúˈtər). In the word *engineering*, the third syllable is stressed most heavily, but the first syllable is stressed more than the second or fourth, so the first syllable is followed by a grave accent, indicating secondary stress (enˈjə-nēˈrēŋg).

Special Characters and Diacritics

The dictionary’s pronunciation schema keeps the use of technical phonetic characters to a minimum. Instead, a system that is more familiar to most Americans represents short vowels with plain letters (a, e, i, o, u) and long vowels with overbars (ā, ē, ī, ō, ū). The ligatured *o*’s represent the vowel sounds in the words *foot* (ō) and *food* (ū).

The letter *a* with an umlaut (ä) is included as an alternative to the short *o* (o). It is used when the vowel is represented orthographically by some

Introduction

letter or combination of letters other than the letter *a*, such as *a* (as in *father*), *au* (as in *caught*), or *aw* (as in *dawn*). This is done mainly to avoid confusing the reader visually with pronunciations such as won'dər for the word *wander*.

One other pair of alternative characters is used to represent a single vowel sound: the schwa (ə) and a short u (u). Traditionally, the schwa has been reserved for unstressed, or reduced, vowels, but in recent years it has become much more commonly used in dictionaries to also represent the short, stressed *u*. In this dictionary, the short *u* is used only in words that are spelled with the letter *u*, and the schwa is used for all other spellings except for "syllabic *l*'s," in which cases the vowel is dropped entirely, as in the word *little* (li'tl).

One other diacritic used in the pronunciations is a circumflex over the letter *a* (â). This is used instead of the short *e* only in combination with the letter *r*, to represent the vowel sound heard in words such as *air*, *software*, and *very*. This is done to avoid representations such as ker'ək-tər for the word *character*, which might lead some readers to believe that the sound should be pronounced as is the *er* in the word *her*.

Acronyms

When acronyms are pronounced as a series of sounded-out letters, capital letters are used to represent the pronunciation of the letters; for example, the pronunciation for the term *EPS* is E'P-S', not Ē'pē-es'. *Note:* Letter-by-letter pronunciations are included for all acronyms in the dictionary, even those that are pronounced as words by most people; for example, the pronunciation for the term *ASCII* includes both a'skē and A'S-C-I-I'.

Pronunciation Symbols

The following charts include the characters used for the pronunciations in the *Microsoft Press Computer Dictionary, Third Edition* (MPCD), the International Phonetic Alphabet (IPA) symbols to which those characters correspond, and some example words in which the letter or letters that represents each sound is underlined. No attempt has been made to repre-

sent foreign sounds as they are pronounced in their original language; only Americanized pronunciations are given for foreign words and names.

VOWELS

| MPCD | IPA | Representative Words |
|------|-----|--|
| a | æ | <u>bat</u> |
| ā | e | <u>ape</u> |
| ā | ɑ | <u>father</u> |
| ô | ɔ | <u>dawn</u> |
| är | ɔr | <u>dart</u> |
| âr | ɛr | <u>hair</u> |
| e | ɛ | <u>let</u> |
| ē | i | <u>bee</u> , <u>equal</u> |
| ēr | ir | <u>hear</u> |
| i | ɪ | <u>sit</u> |
| ī | aɪ | <u>nice</u> |
| īr | aɪr | <u>wire</u> |
| o | ɑ | <u>hot</u> |
| ō | o | <u>oats</u> , <u>home</u> |
| ōr | or | <u>torn</u> |
| ōo | u | <u>book</u> |
| ōor | Ur | <u>tour</u> |
| ōō | u | <u>boot</u> , <u>rule</u> |
| oi | ɔɪ | <u>oil</u> , <u>boy</u> |
| ou | aʊ | <u>out</u> |
| u | ʌ | <u>cup</u> |
| ur | ʊ | <u>purge</u> |
| ə | ə | <u>about</u> , <u>item</u> , <u>edible</u> , <u>gallop</u> |
| ər | ər | <u>ever</u> |

CONSONANTS

| MPCD | IPA | Representative Words |
|------|------|--|
| b | b | <u>bit</u> |
| ch | tʃ | <u>child</u> , <u>ratchet</u> |
| d | d | <u>dog</u> |
| f | f | <u>fill</u> , <u>phobia</u> , <u>laugh</u> |
| g | g | <u>gold</u> , <u>ghost</u> |
| h | h | <u>home</u> |
| j | dʒ | <u>jail</u> , <u>ledge</u> |
| k | k | <u>kid</u> , <u>cow</u> , <u>chrome</u> |
| l | l, ɫ | <u>live</u> , <u>double</u> |
| m | m | <u>map</u> |
| n | n | <u>not</u> , <u>know</u> |

| | | |
|----|-------|-----------------------|
| ng | ng, ŋ | finger, sing |
| p | p | pine, apple |
| r | r | rat |
| s | s | soon, cell |
| sh | ʃ | shoe, notion, charade |
| t | t | test |
| th | θ | thin |
| dh | ð | then |
| v | v | vine |
| w | w | wine |
| hw | ʍ | whine |
| y | j | yet |
| z | z | zoom, beds |
| zh | ʒ | pleasure, collage |

Parts of Speech

Entries are broken down into four parts of speech, in addition to prefixes, abbreviated as follows:

| | |
|-------------|-----------|
| <i>n.</i> | noun |
| <i>vb.</i> | verb |
| <i>adj.</i> | adjective |
| <i>adv.</i> | adverb |

Definitions

Each of the more than 7,300 entries is written in clear, standard English. Many go beyond a simple definition to provide additional detail and to put the term in context for a typical computer user. When an entry has more than one sense or definition, the definitions are presented in a numbered list, to make it easier to distinguish the particular, sometimes subtle, variations in meaning.

Illustration and Table References

Some entries have affiliated illustrations or tables that aid in defining the entry. In most cases, illustrations and tables appear on the same page as the entries to which they apply. In some instances, however, page layout requirements have forced them to a subsequent page. Entries with illustrations or tables usually have references at the end of the definition for an entry, in the following formats:

See the illustration.
See the table.

Acronyms

Some terminology in the computer field, particularly computer standards and Internet slang, can be shortened to form acronyms. Sometimes the acronym is the more common way to refer to the concept or object; in these cases, the acronym is the main entry. In other cases, the acronym is not as commonly used as the words or phrase for which it stands. In these cases, the words or phrase constitute the main entry. The acronym is given after the definition for these entries in the following format:

Acronym:

Alternative Names

Some items or concepts in the computer field can be referred to by more than one name. Generally, though, one way is preferred. The preferred terminology is the main entry. Alternative names are listed after any acronyms; otherwise they are listed after the definition in the following format:

Also called:

Cross-References

Cross-references are of three types: *See*, *See also*, and *Compare*. A *See* reference is used in an entry that is a synonymous cross-reference and simply points to another entry that contains the information sought. A *See also* reference points to one or more entries that contain additional or supplemental information about a topic and follows any acronyms or alternative names after the definition. A *Compare* reference points to an entry or entries that offer contrast and follows any *See also* references; otherwise it follows any acronyms or alternative names after the definition.

Future Printings and Editions

Every effort has been made to ensure the accuracy and completeness of this book. If you find an error, think that an entry does not contain enough information, or seek an entry that does not appear in this edition, please let us know. Address your letter to:



Dictionary Editor, Microsoft Press, One Microsoft Way, Redmond, WA 98052-8302. Or send e-mail to mSPcd@microsoft.com.

Online Updates

Quarterly updates and revisions will be made to the *Microsoft Press Computer Dictionary, Third Edition*, on the Microsoft Press Web site (<http://mSPress.microsoft.com>). These updates are meant to supple-

ment the content of this dictionary and keep it up to date in regard to computer technology, which is one of the fastest-evolving fields in the world today. Simply point your Web browser to <http://mSPress.microsoft.com/mSPress/products/1031> to access the update page for the dictionary. Please note that the content of the updates is in HTML format and is not available in a separate file for downloading. The updates are meant to be viewed on the Microsoft Press Web site.



both privately owned and public-access network computers. *See also* asynchronous transmission, CCITT, channel (definition 2), communications protocol, IEEE, ISDN, ISO/OSI model, LAN, modem, network, synchronous transmission. *Compare* data transmission, telecommunications, teleprocess.

Communications Act of 1934 \kə-myōō-nə-kā'-shənz akt əv nīn'tēn-thər-tē-fōr' \ *n.* *See* FCC.

communications channel \kə-myōō-nə-kā'shənz chan'əl \ *n.* *See* channel (definition 2).

communications controller \kə-myōō-nə-kā'-shənz kən-trōl'ər \ *n.* A device used as an intermediary in transferring communications to and from the host computer to which it is connected. By relieving the host computer of the actual tasks of sending, receiving, deciphering, and checking transmissions for errors, a communications controller helps to make efficient use of the host computer's processing time—time that might be better used for noncommunications tasks. A communications controller can be either a programmable machine in its own right or a nonprogrammable device designed to follow certain communications protocols. *See also* front-end processor (definition 2).

communications link \kə-myōō-nə-kā'shənz lēnk' \ *n.* The connection between computers that enables data transfer.

communications network \kə-myōō-nə-kā'shənz net'wərk \ *n.* *See* network.

communications parameter \kə-myōō-nə-kā'-shənz pər-am'ə-tər' \ *n.* Any of several settings required in order to enable computers to communicate. In asynchronous communications, for example, modem speed, number of data bits and stop bits, and type of parity are parameters that must be set correctly to establish communication between two modems.

communications port \kə-myōō-nə-kā'shənz pōrt' \ *n.* *See* COM (definition 1).

communications program \kə-myōō-nə-kā'shənz prō'gram \ *n.* A software program that enables a computer to connect with another computer and to exchange information. For initiating communications, communications programs perform such tasks as maintaining communications parameters, storing and dialing phone numbers automatically,

recording and executing logon procedures, and repeatedly dialing busy lines. Once a connection is made, communications programs can also be instructed to save incoming messages on disk or to find and transmit disk files. During communication, these types of programs perform the major, and usually invisible, tasks of encoding data, coordinating transmissions to and from the distant computer, and checking incoming data for transmission errors.

communications protocol \kə-myōō-nə-kā'shənz prō'tə-kol' \ *n.* A set of rules or standards designed to enable computers to connect with one another and to exchange information with as little error as possible. The protocol generally accepted for standardizing overall computer communications is a seven-layer set of hardware and software guidelines known as the OSI (Open Systems Interconnection) model. A somewhat different standard, widely used before the OSI model was developed, is IBM's SNA (Systems Network Architecture). The word *protocol* is often used, sometimes confusingly, in reference to a multitude of standards affecting different aspects of communication, such as file transfer (for example, XMODEM and ZMODEM), handshaking (for example, XON/XOFF), and network transmissions (for example, CSMA/CD). *See also* ISO/OSI model, SNA.

communications satellite \kə-myōō-nə-kā'shənz sat'ə-līt' \ *n.* A satellite stationed in geosynchronous orbit that acts as a microwave relay station, receiving signals sent from a ground-based station (earth station), amplifying them, and retransmitting them on a different frequency to another ground-based station. Initially used for telephone and television signals, communications satellites can also be used for high-speed transmission of computer data. Two factors affecting the use of satellites with computers, however, are propagation delay (the time lag caused by the distance traveled by the signal) and security concerns. *See also* downlink, uplink.

communications server \kə-myōō-nə-kā'shənz sər'vər' \ *n.* A gateway that translates packets on a local area network (LAN) into asynchronous signals, such as those used on telephone lines or in RS-232-C serial communications, and allows all nodes on the LAN access to its modems or

operating system and resides there for as long as the computer is on. *Compare* external command.

internal font \in-tər-nəl font\ *n.* A font that is already loaded in a printer's memory (ROM) when the printer is shipped. *Compare* downloadable font, font cartridge.

internal interrupt \in-tər-nəl in-tər-upt\ *n.* An interrupt generated by the processor itself in response to certain predefined situations, such as an attempt to divide by zero or an arithmetic value exceeding the number of bits allowed for it. *See also* interrupt. *Compare* external interrupt.

internal memory \in-tər-nəl mem-ər-ē\ *n.* *See* primary storage.

internal modem \in-tər-nəl mō-dəm\ *n.* A modem constructed on an expansion card to be installed in one of the expansion slots inside a computer. *Compare* external modem, integral modem.

internal schema \in-tər-nəl skē-mə\ *n.* A view of information about the physical files composing a database, including filenames, file locations, accessing methodology, and actual or potential data derivations, in a database model such as that described by ANSI/X3/SPARC, that supports a three-schema architecture. The internal schema corresponds to the schema in systems based on CODASYL/DBTG. In a distributed database, there may be a different internal schema at each location. *See also* conceptual schema, schema.

internal sort \in-tər-nəl sōrt\ *n.* **1.** A sorting operation that takes place on files completely or largely held in memory rather than on disk during the process. **2.** A sorting procedure that produces sorted subgroups of records that will be subsequently merged into one list.

International Federation of Information Processing \in-tər-nash-ə-nəl fed-ər-ā-shən əv in-fər-mā-shən pros-es-ēng\ *n.* *See* IFIP.

International Organization for Standardization \in-tər-nash-ə-nəl ōr-gə-nə-zā-shən fōr stan-dər-də-zā-shən\ *n.* *See* ISO.

International Telecommunications Union \in-tər-nash-ə-nəl tel-ə-kə-myōō-nə-kā-shənz yōōn-yən\ *n.* An intergovernmental organization responsible for making recommendations and standardization regarding telephone and data communications systems for public and private

telecommunication organizations. The ITU was founded in 1865 and became an agency of the United Nations in 1947. The ITU was formerly known as CCITT (Comité Consultatif International Télégraphique et Téléphonique) and changed its name to ITU in March 1993. They may be contacted at International Telecommunications Union, Information Services Department, Place des Nations, 1211 Geneva 20, Switzerland. Telephone: +41 (22) 730 5554. Fax: +41 (22) 730 5337. E-mail: helpdesk@itu.ch, teledoc@itu.arcom.ch. *Acronym:* ITU (I'T-U').

International Telegraph and Telephone Consultative Committee \in-tər-nash-ə-nəl tel-ə-graf and tel-ə-fōn kən-sul-tə-tiv kə-mit-ē, kən-sul-tā-tiv\ *n.* *See* CCITT.

Internaut \in-tər-nāt, in-tər-nôt\ *n.* *See* cybernaut.

internet \in-tər-net\ *n.* Short for internetwork. A set of computer networks that may be dissimilar and are joined together by means of gateways that handle data transfer and conversion of messages from the sending networks' protocols to those of the receiving network.

Internet \in-tər-net\ *n.* The worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational, and other computer systems, that route data and messages. One or more Internet nodes can go off line without endangering the Internet as a whole or causing communications on the Internet to stop, because no single computer or network controls it. The genesis of the Internet was a decentralized network called ARPANET created by the Department of Defense in 1969 to facilitate communications in the event of a nuclear attack. Eventually other networks, including BITNET, Usenet, UUCP, and NSFnet, were connected to ARPANET. Currently, the Internet offers a range of services to users, such as FTP, e-mail, the World Wide Web, Usenet news, Gopher, IRC, telnet, and others. *Also called* the Net. *See also* BITNET, FTP¹ (definition 1), Gopher, IRC, NSFnet, telnet¹, Usenet, UUCP, World Wide Web.

Internet access \in'tər-net ak'ses\ *n.* **1.** The capability of a user to connect to the Internet. This is generally accomplished through one of two ways. The first is through a dialing up of an Internet service provider or an online information services provider via a modem connected to the user's computer. This method is the one used by the majority of home computer users. The second way is through a dedicated line, such as a T1 carrier, that is connected to a local area network, to which, in turn, the user's computer is connected. The dedicated line solution is used by larger organizations, such as corporations, which either have their own node on the Internet or connect to an Internet service provider that is a node. A third way that is emerging is for users to use set-top boxes with their TVs. Generally, however, this will give a user access only to documents on the World-Wide Web. *See also* dedicated line (definition 1), ISP, LAN, modem, node (definition 2), set-top box. **2.** The capability of an online information service to exchange data with the Internet, such as e-mail, or to offer Internet services to users, such as newsgroups, FTP, and the World Wide Web. Most online information services offer Internet access to their users. *See also* FTP¹ (definition 1), online information service.

Internet access device \in'tər-net ak'ses də-vīs\ *n.* A communications and signal-routing mechanism, possibly incorporating usage tracking and billing features, for use in connecting multiple remote users to the Internet.

Internet access provider \in'tər-net ak'ses prə-vī dər\ *n.* *See* ISP.

Internet account \in'tər-net ə-kount\ *n.* A generic term for a registered username at an Internet Service Provider (ISP). An Internet account is accessed via username and password. Services such as dial-in PPP Internet access and e-mail are provided by ISPs to Internet account owners.

Internet address \in'tər-net ə-dres, ə-dres\ *n.* *See* domain name address, e-mail address, IP address.

Internet appliance \in'tər-net ə-plī'əns\ *n.* *See* set-top box.

Internet Architecture Board \in'tər-net ār'kə-tek-chur bōrd\ *n.* The body of the Internet Society (ISOC) responsible for overall architectural

considerations regarding the Internet. The IAB also serves to adjudicate disputes in the standards process. *Acronym:* IAB (I'A-B). *See also* Internet Society.

Internet Assigned Numbers Authority \in'tər-net ə-sīnd' num'bərz ə-thōr'ə-tē\ *n.* A unit of the Internet Architecture Board that registers and controls the assignment of various Internet-related numerical designations, such as IP port, protocol, and enterprise numbers. *Acronym:* IANA (I'A-N-A').

Internet backbone \in'tər-net bak'bōn\ *n.* One of several high-speed networks connecting many local and regional networks, with at least one connection point where it exchanges packets with other Internet backbones. Historically, the NSFnet (predecessor to the modern Internet) was the backbone to the entire Internet in the United States. This backbone linked the supercomputing centers that the National Science Foundation (NSF) runs. Today, different providers have their own backbones so that the backbone for the supercomputing centers is independent of backbones for commercial Internet providers such as MCI and Sprint. *See also* backbone.

Internet broadcasting \in'tər-net brəd'ka-stēng\ *n.* Broadcasting of audio, or audio plus video, signals across the Internet. Internet broadcasting includes conventional over-the-air broadcast stations that transmit their signals into the Internet as well as Internet-only stations. Listeners use audio Internet software, such as RealAudio. One method of Internet broadcasting is MBONE. *See also* MBONE, RealAudio.

Internet Control Message Protocol \in'tər-net kən-trōl' mes'əj prō'tə-kol\ *n.* *See* ICMP.

Internet Draft \in'tər-net draft\ *n.* A document produced by the IETF (Internet Engineering Task Force) for purposes of discussing a possible change in standards that govern the Internet. An Internet Draft is subject to revision or replacement at any time; if not replaced or revised, the Internet Draft is valid for no more than six months. An Internet Draft, if accepted, may be developed into an RFC. *See also* IETF, RFC.

Internet Engineering and Planning Group \in'tər-net en-jə-nēr'ēng ənd plan'ēng grōp\ *n.* *See* IEPG.

Internet Engineering Steering Group \in`tar-net en-jə-nēr`ēng stēr`ēng grōōp\ *n.* The group within the Internet Society (ISOC) that, along with the Internet Architecture Board (IAB), reviews the standards proposed by the Internet Engineering Task Force (IETF). *Acronym:* IESG (I`E-S-G`).

Internet Engineering Task Force \in`tar-net en-jə-nēr`ēng task` fōrs\ *n.* See IETF.

Internet Explorer \in`tar-net eks-plōr`ər\ *n.* Microsoft's Web browser, introduced in October 1995. Internet Explorer is now available in Windows and Macintosh versions. Later versions provide the ability to incorporate advanced design and animation features into Web pages and recognize ActiveX controls and Java applets. *See also* ActiveX controls, Java applet, Web browser.

Internet gateway \in`tar-net gāt`wā\ *n.* A device that provides the connection between the Internet backbone and another network, such as a LAN (local area network). Usually the device is a computer dedicated to the task or a router. The gateway generally performs protocol conversion between the Internet backbone and the network, data translation or conversion, and message handling. A gateway is considered a node on the Internet. *See also* gateway, Internet backbone, node (definition 2), router.

Internet Group Membership Protocol \in`tar-net grōōp` mem`bər-ship prō`tə-kol\ *n.* A protocol used by IP hosts to report their host group memberships to any immediately neighboring multicast routers. *Acronym:* IGMP (I`G-M-P`).

Internet Information Server \in`tar-net in`fər-mā`shən sər`vər\ *n.* Microsoft's brand of Web server software, utilizing Hypertext Transfer Protocol to deliver World Wide Web documents. It incorporates various functions for security, allows for CGI programs, and also provides for Gopher and FTP servers.

Internet Naming Service \in`tar-net nā`mēng sər`vis\ *n.* See WINS.

Internet Protocol \in`tar-net prō`tə-kol\ *n.* See IP.

Internet Protocol next generation \in`tar-net prō`tə-kol nekst` jen-ər-ā`shən\ *n.* See IPng.

Internet Relay Chat \in`tar-net rē`lā chat\ *n.* See IRC.

Internet Research Steering Group \in`tar-net rē`sərch stēr`ēng grōōp\ *n.* The governing body

of the Internet Research Task Force (IRTF). *Acronym:* IRSG (I`R-S-G`).

Internet Research Task Force \in`tar-net rē`sərch task` fōrs\ *n.* A volunteer organization that makes long-term recommendations concerning the Internet to the Internet Architecture Board. *Acronym:* IRTF (I`R-T-F`). *See also* Internet Society.

Internet robot \in`tar-net rō`bot\ *n.* See spider.

Internet security \in`tar-net se-kyər`ə-tē\ *n.* A broad topic dealing with all aspects of data authentication, privacy, integrity, and verification for transactions over the Internet. For example, credit card purchases made via a World Wide Web browser require attention to Internet security issues to ensure that the credit card number is not intercepted by an intruder or copied from the server where the number is stored, and to verify that the credit card number is actually sent by the person who claims to be sending it.

Internet Server Application Programming Interface \in`tar-net sər-vər a-plə-kā`shən prō`gram-ēng in`tər-fās\ *n.* See ISAPI.

Internet service provider \in`tar-net sər`vəs prə-vī`dər\ *n.* See ISP.

Internet Society \in`tar-net sə-sī`ə-tē\ *n.* An international organization, comprising individuals, companies, foundations, and government agencies, that promotes the use, maintenance, and development of the Internet. The Internet Architecture Board (IAB) is a body within the Internet Society. In addition, the Internet Society publishes the *Internet Society News* and produces the annual INET conference. *Acronym:* ISOC (I`sok, I`S-O-C`). *See also* INET (definition 2), Internet Architecture Board.

Internet Software Consortium \in`tar-net soft`wār kən-sōr`shē-əm, kən-sōr`shəm\ *n.* A nonprofit organization that develops software that is available for free, via the World Wide Web or FTP, as well as development of Internet standards such as the Dynamic Host Configuration Protocol (DHCP). *See also* DHCP.

Internet Talk Radio \in`tar-net tāk rā`dē-ō\ *n.* Audio programs similar to radio broadcasts but distributed over the Internet in the form of files that can be downloaded via FTP. Internet Talk Radio programs, prepared at the National Press Building in Washington, D.C., are 30 minutes to 1 hour in length; a 30-minute program requires

about 15 MB of disk space. Features include the Internet Hall of Fame and the Geek of the Week.

Acronym: ITR (I-T-R').

Internet telephone \in'tər-net tel'ə-fōn\ *n.* Point-to-point voice communication that uses the Internet instead of the public-switched telecommunications network to connect the calling and called parties. Both the sending and the receiving party need a computer, a modem, an Internet connection, and an Internet telephone software package to make and receive calls.

Internet television \in'tər-net tel'ə-vizh-ən\ *n.* The transmission of television audio and video signals over the Internet.

internetwork \in'tər-net'wɜrk\ *adj.* Of or pertaining to communications between connected networks. Often used to refer to communication between one local area network and another over the Internet or another wide-area network. *See also* LAN, wide area network.

Internetwork Packet Exchange \in'tər-net-wɜrk pak'ət eks-čānj\ *n.* *See* IPX.

Internet Worm \in'tər-net wɜrm\ *n.* A string of self-replicating computer code that was distributed through the Internet in November 1988. In a single night, it overloaded and shut down a large portion of the computers connected to the Internet at that time by replicating itself over and over on each computer it accessed, exploiting a bug in UNIX systems. Intended as a prank, the Internet Worm was written by a student at Cornell University. *See also* back door, worm.

InterNIC \in'tər-nik, in'tər-N-I-C\ *n.* Short for NSFnet (**Internet**) Network Information Center. The organization that is charged with registering domain names and IP addresses as well as distributing information about the Internet. InterNIC was formed in 1993 as a consortium involving the U.S. National Science Foundation, AT&T, General Atomics, and Network Solutions Inc. (Herndon, Va.). The latter partner administers InterNIC Registration Services, which assigns Internet names and addresses. InterNIC can be reached by e-mail at info@internic.net or on the Web at <http://www.internic.net/>.

interoperability \in'tər-op'ər-ə-bil'ə-tē\ *n.* Referring to components of computer systems that are able to function in different environments. For

example, Microsoft's NT operating system is interoperable on Intel, DEC Alpha, and other CPUs. Another example is the SCSI standard for disk drives and other peripheral devices that allows them to interoperate with different operating systems. With software, interoperability occurs when programs are able to share data and resources. Microsoft Word, for example, is able to read files created by Microsoft Excel.

interpolate \in-tər'pə-lāt\ *vb.* To estimate intermediate values between two known values in a sequence.

interpret \in-tər'prət\ *vb.* **1.** To translate a statement or instruction into executable form and then execute it. **2.** To execute a program by translating one statement at a time into executable form and executing it before translating the next statement, rather than by translating the program completely into executable code (compiling it) before executing it separately. *See also* interpreter. *Compare* compile.

interpreted language \in-tər'prə-təd lang'wəj\ *n.* A language in which programs are translated into executable form and executed one statement at a time rather than being translated completely (compiled) before execution. Basic, LISP, and APL are generally interpreted languages, although Basic can also be compiled. *See also* compiler. *Compare* compiled language.

interpreter \in-tər'prə-tər\ *n.* A program that translates and then executes each statement in a program written in an interpreted language. *See also* compiler, interpreted language, language processor.

interprocess communication \in'tər-pros'es kə-myōō-nə-kā'shən\ *n.* The ability of one task or process to communicate with another in a multi-tasking operating system. Common methods include pipes, semaphores, shared memory, queues, signals, and mailboxes. *Acronym:* IPC (I-P-C').

inter-record gap \in'tər-ek'ərd gap\ *n.* An unused space between data blocks stored on a disk or tape. Because the speed of disks and tapes fluctuates slightly during operation of the drives, a new data block may not occupy the exact space occupied by the old block it overwrites. The inter-record gap prevents the new block from overwriting

tion, ion-deposition printers tend to produce thick, slightly fuzzy characters; the technology is also more expensive than that of a laser printer. *See also* electrophotographic printers, nonimpact printer, page printer. *Compare* laser printer, LCD printer, LED printer.

I/O port \I-O' pōrt\ *n.* *See* input/output port.

I/O processor \I-O' pros'es-ər\ *n.* *See* input/output processor.

IO.SYS \ī'ō-sis\, I-O'dot-S-Y-S'\ *n.* One of two hidden system files installed on an MS-DOS startup disk. IO.SYS in IBM releases of MS-DOS (called IBMBIO.COM) contains device drivers for peripherals such as the display, keyboard, floppy disk drive, hard disk drive, serial port, and real-time clock. *See also* MSDOS.SYS.

IP \I-P'\ *n.* Acronym for **Internet Protocol**. The protocol within TCP/IP that governs the breakup of data messages into packets, the routing of the packets from sender to destination network and station, and the reassembly of the packets into the original data messages at the destination. IP corresponds to the network layer in the ISO/OSI model. *See also* ISO/OSI model, TCP/IP. *Compare* TCP.

IP address \I-P' a'dres, ə-dres\ *n.* Short for **Internet Protocol address**. A 32-bit (4-byte) binary number that uniquely identifies a host (computer) connected to the Internet to other Internet hosts, for the purposes of communication through the transfer of packets. An IP address is expressed in "dotted quad" format, consisting of the decimal values of its 4 bytes, separated with periods; for example, 127.0.0.1. The first 1, 2, or 3 bytes of the IP address, assigned by InterNIC Registration Services, identify the network the host is connected to; the remaining bits identify the host itself. The 32 bits of all 4 bytes together can signify almost 2^{32} , or roughly 4 billion, hosts. (A few small ranges within that set of numbers are not used.) *See also* host, InterNIC, IP, packet (definition 2). *Compare* domain name.

IPC \I-P-C'\ *n.* *See* interprocess communication.

IPL \I-P-L'\ *n.* *See* initial program load.

IP multicasting \I-P' mul'tē-kas'tēng, mul'tī-kas'tēng\ *n.* Short for **Internet Protocol multicasting**. The extension of local area network multicasting technology to a TCP/IP network. Hosts send and receive multicast datagrams, the destina-

tion fields of which specify IP host group addresses rather than individual IP addresses. A host indicates that it is a member of a group by means of the Internet Group Management Protocol. *See also* datagram, Internet Group Membership Protocol, IP, MBONE, multicasting.

IPng \I'pēng, I'P-N-G'\ Acronym for **Internet Protocol next generation**. A version of Internet Protocol (IP) developed by the Internet Engineering Task Force (IETF). Improvements over the original Internet Protocol include better security and an increased IP address size of 16 bytes. *See also* IETF, IP, IP address.

IP spoofing \I-P' spōō'fēng\ *n.* The act of inserting a false sender IP address into an Internet transmission in order to gain unauthorized access to a computer system. *See also* IP address, spoofing.

IP switching \I-P' swich'ēng\ *n.* A technology developed by Ipsilon Networks (Sunnyvale, Calif.) that enables a sequence of IP packets with a common destination to be transmitted over a high-speed, high-bandwidth Asynchronous Transfer Mode (ATM) connection.

IPv6 \I'P-V-siks\ *n.* Short for **Internet Protocol version 6**. A proposed next generation for the Internet Protocol, currently version 4, which was introduced in September 1995 by the Internet Engineering Task Force and formerly known as IPng. *See also* IP, IPng.

IPX \I'P-X'\ *n.* Acronym for **Internetwork Packet Exchange**. The protocol in Novell NetWare that governs addressing and routing of packets within and between LANs. IPX packets can be encapsulated in Ethernet packets or Token Ring frames. IPX operates at ISO/OSI levels 3 and 4 but does not perform all the functions at those levels. In particular, IPX does not guarantee that a message will be complete (no lost packets); SPX has that job. *See also* Ethernet (definition 1), packet, Token Ring network. *Compare* SPX (definition 1).

IPX/SPX \I'P-X-S'P-X'\ *n.* The network and transport level protocols used by Novell NetWare, which together correspond to the combination of TCP and IP in the TCP/IP protocol suite. *See also* IPX, SPX (definition 1).

.iq \dot'I-Q'\ *n.* On the Internet, the major geographic domain specifying that an address is located in Iraq.

LLC \LˈL-Cˈ\ *n.* See IEEE 802 standards.

load¹ \lɔd\ *n.* **1.** The total computing burden a system carries at one time. **2.** In electronics, the amount of current drawn by a device. **3.** In communications, the amount of traffic on a line.

load² \lɔd\ *vb.* To place information from storage into memory for processing, if it is data, or for execution, if it is program code.

load-and-go \lɔdˈænd-gōˈ\ *adj.* In reference to a routine, able to begin execution immediately, once loaded. The term is commonly used in reference to compilers and the machine code they generate.

loaded line \lɔˈdæd līnˈ\ *n.* A transmission cable fitted with loading coils, usually spaced about a mile apart, that reduce amplitude distortion in a signal by adding inductance (resistance to changes in current flow) to the line. Loaded lines minimize distortion within the range of frequencies affected by the loading coils, but the coils also reduce the bandwidth available for transmission.

loader \lɔˈdər\ *n.* A utility that loads the executable code of a program into memory for execution. On most microcomputers, the loader is an invisible part of the operating system and is automatically invoked when a program is run. See also load module, loader routine.

loader routine \lɔˈdər rɔd-tēnˈ\ *n.* A routine that loads executable code into memory and executes it. A loader routine can be part of an operating system or it can be part of the program itself. See also loader, overlay¹ (definition 1).

load module \lɔdˈ moj ɔd, moˈdyɔd\ *n.* An executable unit of code loaded into memory by the loader. A program consists of one or more load modules, each of which can be loaded and executed independently. See also loader.

load point \lɔdˈ point\ *n.* The beginning of the valid data area on a magnetic tape.

load sharing \lɔdˈ shār ɛŋ\ *n.* A method of managing one or more tasks, jobs, or processes by scheduling and simultaneously executing portions of them on two or more microprocessors.

local \lɔˈkəl\ *adj.* Close at hand or restricted to a particular area. More specifically, in communications, a local device is one that can be accessed directly rather than by means of a communications

line. In information processing, a local operation is one performed by the computer at hand rather than by a remote computer. In programming, a local variable is a variable that is restricted in scope, that is, used in only one part (subprogram, procedure, or function) of a program. Compare remote.

local area network \lɔˈkəl ār ɛ-ə netˈwɜrk\ *n.* See LAN.

local bus \lɔˈkəl busˈ\ *n.* A PC architecture designed to speed up system performance by allowing some expansion boards to communicate directly with the microprocessor, bypassing the normal system bus entirely. See also PCI local bus, VL bus.

local bypass \lɔˈkəl bīˈpas\ *n.* A telephone connection used by some businesses that links separate buildings but bypasses the telephone company.

local group \lɔˈkəl grɔpˈ\ *n.* **1.** In Windows NT, a group that is granted permissions and rights to only those resources on the workstation on which the group resides. Local groups provide a convenient means of allowing users both inside and outside the workstation to use resources found only on the workstation containing the local group. See also group¹. **2.** In Windows NT Advanced Server, a group that is granted permissions and rights to only the resources on the servers of its own domain. Local groups in this context provide a convenient means of allowing users from both inside and outside the domain to use resources found only on the servers of the domain. See also global group, group¹.

localhost \lɔˈkəl-hɔstˈ\ *n.* The name that is used to represent the same computer on which a TCP/IP message originates. An IP packet sent to localhost has the IP address 127.0.0.1 and does not actually go out to the Internet. See also IP address, packet (definition 1), TCP/IP.

localization \lɔˈkə-lə-zāˈshən\ *n.* The process of altering a program so that it is appropriate for the area in which it is used. For example, the developers of a word processing program must localize the sorting tables in the program for different countries or languages because the correct order of characters in one language might be incorrect in another.

cially available Web browsers. *See also* Mosaic, Web browser.

Netscape Server Application Programming Interface \net-skāp sər-vər a-plə-kā-shən prō-gram-ēng in tər-fās\ *n.* *See* NSAPI.

Netspeak \netˈspēk\ *n.* The set of conventions for writing English in e-mail, IRCs, and newsgroups. Netspeak is characterized by acronyms (such as IMHO or ROFL) and clarifying devices such as emotags and emoticons. Use of Netspeak should be governed by netiquette. *See also* emotag, emoticon, IMHO, IRC, netiquette, ROFL.

Net surfing \netˈsʊrfēŋ\ *n.* The practice of exploring the Internet without a specific goal in mind. The concept of Net surfing is similar to (and probably derived from) "channel surfing" in reference to watching television.

net-top box \netˈtop boks\ *n.* A type of personal computer with a reduced number of components that is built primarily to provide a low-cost access terminal to the various services available on the Internet, such as e-mail, Web access, and telnet connectivity. These machines, which are under development, will not have locally addressable hard disks or installable programs, but will obtain any necessary materials for the user from somewhere on a network to which the net-top box is connected. *Compare* Java terminal, NetPC.

Net TV \netˈT-V\ *n.* *See* Internet television.

NetWare \netˈwār\ *n.* Novell's LAN operating system. NetWare runs on many different hardware platforms and network configurations.

network \netˈwɜrk\ *n.* A group of computers and associated devices that are connected by communications facilities. A network can involve permanent connections, such as cables, or temporary connections made through telephone or other communication links. A network can be as small as a local area network consisting of a few computers, printers, and other devices, or it can consist of many small and large computers distributed over a vast geographic area.

network adapter \netˈwɜrk ə-dapˈtər\ *n.* An expansion card or other device used to connect a computer to a local area network.

network address translation \netˈwɜrk əˈdres tranz-lā-shən, ə-dres\ *n.* *See* NAT.

network administrator \netˈwɜrk əd-minˈə-strā-tər\ *n.* The person in charge of operations on a computer network. The duties of a network administrator can be broad and might include such tasks as installing new workstations and other devices, adding and removing individuals from the list of authorized users, archiving files, overseeing password protection and other security measures, monitoring usage of shared resources, and handling malfunctioning equipment. *See also* system administrator.

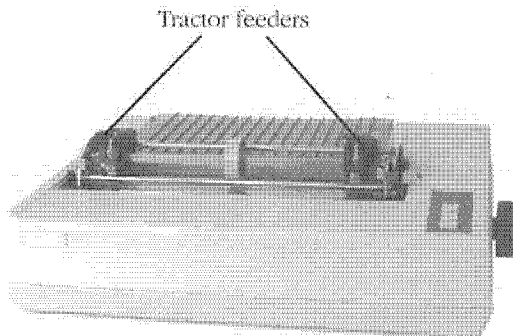
network architecture \netˈwɜrk ərˈkə-tek-chər\ *n.* The underlying structure of a computer network, including hardware, functional layers, interfaces, and protocols, used to establish communication and ensure the reliable transfer of information. Network architectures are designed to provide both philosophical and physical standards for the complexities of establishing communications links and transferring information without conflict. Various network architectures exist, including the internationally accepted seven-layer ISO Open Systems Interconnection (OSI) model and IBM's Systems Network Architecture (SNA). *See also* ISO/OSI model, SNA.

network card \netˈwɜrk kɑrd\ *n.* *See* network adapter.

network computer \netˈwɜrk kəm-pyōˈtər\ *n.* A computer having the hardware and software necessary for it to be connected to a network. *Acronym:* NC (N-C).

network control program \netˈwɜrk kən-trōlˈprō-gram\ *n.* In a communications network that includes a mainframe computer, a program that usually resides in a communications controller and takes over communications tasks such as routing, error control, line control, and polling (checking terminals for transmissions), leaving the main computer free for other functions. *See also* communications controller.

network database \netˈwɜrk dāˈtə-bās\ *n.* **1.** A database that runs in a network. **2.** A database containing the address of other users in the network. **3.** In information management, a type of database in which data records can be related to one another in more than one way. A network database is similar to a hierarchical database in the



Tractor feed. Tractor feeders on a dot-matrix printer.

traditional newsgroup hierarchy \trə-dish'ə-nəl nōōz'grōōp hī'ər-ər-kē, hī'ər-kē\ *n.* The seven standard newsgroup categories in Usenet: comp., misc., news., rec., sci., soc., and talk. Newsgroups can be added within the traditional hierarchy only following a formal voting process. *See also* comp. newsgroups, misc. newsgroups, newsgroup, news. newsgroups, rec. newsgroups, Request for Discussion, sci. newsgroups, soc. newsgroups, talk. newsgroups, Usenet. *Compare* alt. newsgroup.

traffic \traf'ik\ *n.* The load carried by a communications link or channel.

trailer \trā'lar\ *n.* Information, typically occupying several bytes, at the tail end of a block (section) of transmitted data and often containing a checksum or other error-checking data useful for confirming the accuracy and status of the transmission. *See also* checksum. *Compare* header (definition 2).

trailer label \trā'lar lā'bəl\ *n.* **1.** A small block of information used in tape processing that marks the end of a file or the end of the tape and that can contain other information, such as the number of records in the file or files on the tape. *Compare* header label. **2.** A label used in communications data frames that follows the data and might contain an end-of-message mark, a checksum, and some synchronization bits.

trailing edge \trā'lēŋ ej'\ *n.* The latter part of an electronic signal. When a digital signal switches from on to off, the transition is the trailing edge of the signal.

train¹ \trān\ *n.* A sequence of items or events, such as a digital pulse train consisting of transmitted binary signals.

train² \trān\ *vb.* To teach an end user how to use a software or hardware product.

transaction \tranz-ak'shən\ *n.* A discrete activity within a computer system, such as an entry of a customer order or an update of an inventory item. Transactions are usually associated with database management, order entry, and other online systems.

transaction file \tranz-ak'shən fīl\ *n.* A file that contains the details of transactions, such as items and prices on invoices. It is used to update a master database file. *See also* transaction. *Compare* master file.

transaction log \tranz-ak'shən log\ *n.* *See* change file.

transaction processing \tranz-ak'shən pros'es-ēŋ\ *n.* A processing method in which transactions are executed immediately after they are received by the system. *See also* transaction. *Compare* batch processing (definition 3).

Transaction Processing Council \tranz-ak'shən pros'es-ēŋ koun'səl\ *n.* A group of hardware and software vendors with the goal of publishing benchmark standards. *Acronym:* TPC (T-P-C).

transaction processing monitor \tranz-ak'shən pros-es-ēŋ mon'ə-tər\ *n.* *See* TP monitor.

transceiver \tran'sē vər\ *n.* Short for **transmitter/receiver**. A device that can both transmit and receive signals. On local area networks, a transceiver is the device that connects a computer to the network.

transceiver cable \tran-sē vər kā'bl\ *n.* A cable that is used to connect a host adapter within a computer to a local area network (LAN). *See also* AUI cable, LAN.

transducer \tranz'dōō'sər\ *n.* A device that converts one form of energy into another. Electronic transducers either convert electric energy to another form of energy or convert nonelectric to electric energy.

transfer \trans'fər\ *n.* **1.** The movement of data from one location to another. **2.** The passing of program control from one portion of code to another.

transfer rate \trans'fər rāt\ *n.* The rate at which a circuit or a communications channel transfers information from source to destination, as over a network or to and from a disk drive. *Transfer*



spelling of *the*; or reversing two wires in a circuit.
2. In mathematics and spreadsheets, to rotate a matrix (a rectangular array of numbers) about a diagonal axis.

transputer \transˈpyōōˈtār\ *n.* Short for **transistor computer**. A complete computer on a single chip, including RAM and an FPU, designed as a building block for parallel computing systems.

trap¹ \trap\ *n.* See interrupt.

trap² \trap\ *vb.* To intercept an action or event before it occurs, usually in order to do something else. Trapping is commonly used by debuggers to allow interruption of program execution at a given spot. See also interrupt, interrupt handler.

trapdoor \trapˈdōr\ *n.* See back door.

trap handler \trapˈhandˈlār\ *n.* See interrupt handler.

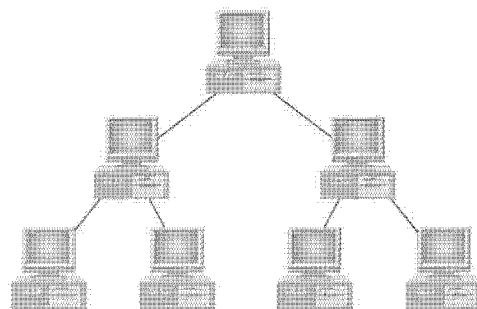
Trash \trash\ *n.* An icon on the screen in the Macintosh Finder, resembling a garbage can. To delete a file or eject a diskette, the user drags the icon for the file or diskette to the Trash. However, until the user shuts down the system or chooses the menu option "Empty Trash," a file in the Trash is not actually deleted; the user can retrieve it by double-clicking the Trash icon and dragging the file's icon out of the resulting window. Compare Recycle Bin.

traverse \trāˈvərs\ *vb.* In programming, to access in a particular order all of the nodes of a tree or similar data structure.

tree \trē\ *n.* A data structure containing zero or more nodes that are linked together in a hierarchical fashion. If there are any nodes, one node is the root; each node except the root is the child of one and only one other node; and each node has zero or more nodes as children. See also child (definition 2), graph, leaf, node (definition 3), parent/child (definition 2), root.

tree network \trēˈnetˈwɜrk\ *n.* A topology for a local area network (LAN) in which one machine is connected to one or more other machines, each of which is connected to one or more others, and so on, so that the structure formed by the network resembles that of a tree. See the illustration. See also bus network, distributed network, ring network, star network, token ring network, topology.

tree search \trēˈsərch\ *n.* A search procedure performed on a tree data structure. At each step



Tree network.

of the search, a tree search is able to determine, by the value in a particular node, which branches of the tree to eliminate, without searching those branches themselves. See also branch (definition 1), tree structure.

tree structure \trēˈstrʊkˈchʊr\ *n.* Any structure that has the essential organizational properties of a tree. See also tree.

trellis-coded modulation \trɛlˈis-kōdɔd moˈdyāˌlāˈshən, mojˈəˌlāˈshən\ *n.* An enhanced form of quadrature amplitude modulation that is used by modems that operate at or above 9,600 bits per second and encodes information as unique sets of bits associated with changes in both the phase and amplitude of the carrier, as well as using extra signal points for error-checking bits. Acronym: TCM (T-C-M). See also quadrature amplitude modulation.

trichromatic \triˈkrəˌmatˈik\ *adj.* Of, pertaining to, or characteristic of a system that uses three colors (red, green, and blue in computer graphics) to create all other colors. See also color model.

trigger \trigˈɜr\ *n.* In a database, an action that causes a procedure to be carried out automatically when a user attempts to modify data. A trigger can instruct the database system to take a specific action, depending on the particular change attempted. Incorrect, unwanted, or unauthorized changes can thereby be prevented, helping to maintain the integrity of the database.

trigonometry \trig əˌnom əˈtrē\ *n.* The branch of mathematics dealing with arcs and angles, expressed in functions (for example, sine and cosine) that show relationships—for example, between two sides of a right triangle or between two complementary angles.

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